AMENDMENTS TO THE CLAIMS

Please cancel claims 1-4, 6, 7, 13 and 14, and amend claims 5, 9, 11 and 12, such that the status of the claims is as follows:

1-4. (Canceled)

5. (Currently amended) An irradiation system comprising:

a radiation source for providing ~~a radiation~~ an electron beam at a first controlled intensity, the ~~radiation~~ electron beam having a beam current and having at least an x-ray component with a second intensity that is proportional to the first intensity;

a current sensor coupled to the radiation source for measuring the beam current provided by the radiation source;

a product location system for advancing the product past the ~~radiation~~ electron beam at a controlled speed, so that the ~~radiation~~ electron beam impinges on the product;

a sensor system for measuring a third intensity of a portion of the x-ray component of the ~~radiation~~ electron beam that passes through the product;

a control system for calculating the second intensity of the x-ray component of the ~~radiation~~ electron beam based on the measured beam current provided by the radiation source, and for adjusting the first intensity of the ~~radiation~~ electron beam based on an absorbed radiation dose which is based on a difference between the third intensity of the portion of the x-ray component of the ~~radiation~~ electron beam that passes through the product and the second intensity of the x-ray component of the ~~radiation~~ electron beam.

6. (Canceled) The irradiation system of claim 5, wherein the radiation source provides an electron beam.

7. (Canceled) The irradiation system of claim 5, wherein the radiation source provides an x-ray beam.

8. (Original) The irradiation system of claim 5, wherein the sensor system includes a scaled linear x-ray sensor array.

9. (Currently amended) The irradiation system of claim 8, wherein the sensor system further includes an attenuator plate for scaling the third intensity of the portion of the x-ray component of the ~~radiation~~ electron beam that passes through the product to correspond with a dynamic range of the linear x-ray sensor array.

10. (Original) The irradiation system of claim 5, wherein the product location system comprises a conveyor.

11. (Currently amended) An irradiation system comprising:

a radiation source for providing ~~a radiation~~ an electron beam having a beam current and having a first intensity profile, the ~~radiation~~ electron beam having at least an x-ray component with a second intensity profile that is proportional to the first intensity profile;

a current sensor coupled to the radiation source for measuring the beam current provided by the radiation source;

a product location system for providing product so that the ~~radiation~~ electron beam impinges on the product;

a sensor system for measuring a third intensity of a portion of at least part of the x-ray component of the ~~radiation~~ electron beam that passes through the product;

a control system for calculating the second intensity profile of the x-ray component of the ~~radiation~~ electron beam based on the measured beam current provided by the radiation source, and for interpreting measurements taken by the sensor system to determine a relative location and type of the product that the ~~radiation~~ electron beam impinges upon, the control system being responsive to the determined relative location and type of the product to adjust at least one of the first intensity profile of the ~~radiation~~ electron beam, a location pattern of successive ~~radiation~~ electron beams, and a speed of advancement of product by the product location system.

12. (Currently amended) A method of irradiating product, comprising:

providing ~~a radiation~~ an electron beam having a controlled beam current;

measuring the beam current of the ~~radiation~~ electron beam;

directing the ~~radiation~~ electron beam onto product;

measuring an intensity of a portion of the ~~radiation~~ electron beam that passes through the product;

calculating an intensity of the provided ~~radiation~~ electron beam based on the measured beam current; and

adjusting the beam current of the provided ~~radiation~~ electron beam to adjust its intensity, based on a difference between the measured intensity of the portion of the ~~radiation~~ electron beam that passes through the product and the calculated intensity of the provided ~~radiation~~ electron beam.

13. (Canceled) The method of claim 12, wherein providing ~~a radiation~~ the electron beam comprises generating an electron beam.

14. (Canceled) The method of claim 13, wherein providing a radiation beam further comprises converting the electron beam to an x-ray beam.

15. (Original) The irradiation system of claim 12, wherein directing the radiation beam onto product comprises advancing product past the radiation beam on a conveyor.

16. (Previously added) An irradiation system comprising:

a radiation source comprising:

an accelerator for providing an electron beam having a beam current

a current sensor coupled to the accelerator for measuring the beam current of the electron beam;

a magnet assembly for controllably shaping and directing the electron beam; and

a scan horn providing an exit path for the electron beam;

a product location system for providing product so that the electron beam impinges on the product;

a radiation sensor system for measuring an intensity of an x-ray portion of the electron beam that passes through the product; and

a control system for calculating a first radiation dose based on the beam current measured by the current sensor, a second radiation dose based on the intensity of the x-ray portion of the electron beam that passes through the product measured by the radiation sensor, and an absorbed radiation dose based on a difference between the first radiation dose and the second radiation dose, and for adjusting a power level of the electron beam provided by the radiation source based on the absorbed radiation dose.

17. (Previously added) The irradiation system of claim 16, wherein the radiation source further comprises a conversion plate for converting the electron beam into an x-ray beam as the electron beam exits that scan horn.